

Mn-Based Organic Magnets: Structure and Dimensionality

Kevin Stone

Department of Physics and Astronomy

Stony Brook University

Stony Brook, NY

Organic-based magnets, which utilize unpaired electrons residing on organic species to form magnetically ordered materials, allow for much greater control than traditional metal or transition metal oxide magnets. Some of the most intriguing examples are amorphous compounds of vanadium and tetracyanoethylene (TCNE), which form room temperature semiconducting magnetic materials. Due to their amorphous nature, much of the understanding of these materials comes from the study of examples based on other metals, which can be structurally characterized. Powder diffraction has proven to be a crucial tool in the investigation of these challenging materials, providing not only a structural context in which to consider the magnetic interactions, but also as a means of determining the composition of the materials. Manganese based examples have proven to be fertile ground for structural studies, and have provided the first example of a 3D magnetic network. The importance of the structural information and the dimensionality of these magnetic systems are made clear by the comparison of this new material to 2D networked analogues.